with the serum of Agaricus. The Tuber extract gave strong precipitation both with Tuber serum and with yeast serum, but none with mushroom serum. The mushroom extract gave a precipitate only with the serum of the animal treated with mushroom extract. From these experiments the writers infer that the yeast is more closely related to the Ascomycetes than it is to the Basidiomycetes. While the precipitin method has been used to a certain extent in attempts to show relationships among animals, too much stress should not be laid on this single experiment with plants. It is possible that albuminous substances from some plants may produce precipitins in the blood of animals that will then react with many plant albumins, just as it has been found that precipitins in animals will affect animals of more and more distant relationship depending on the intensity and duration of the treatment of the original animal.—H. HASSELBRING.

Sand keys of Florida.—MILLSPAUGH[12] has published the results of further exploration of the sand keys of Florida. In 1904 O. E. LANSING, Jr. was sent to examine all the islets lying to the westward of Key West, and his collections, notes, and maps form the basis of the present paper. The vegetation of each islet is mapped in a very effective way. The value of the survey is to enable future students to determine what species have come to the different islets since 1904 and what have been unable to survive; what species come first to such islets; and how species spread when brought into an untainted environment. In a summary it is shown that such species as are able to avail themselves of bird and water transportation, and can withstand or actually need a saline soil and atmosphere, are the species that lay hold of these islets. Wind transportation appears to play no part whatever in the plant colonization of these minute islets. From wide study of such areas in the Antillean region, the author concludes that the order of precedence in the vegetation-covering of the wave-formed sand keys of Florida has been as follows, the method of transportation also being indicated: (1) *Sesuvium portulacastrum* (water), (2) *Cakile fusiformis* (water), (3) *Euphorbia buxifolia* (bird), (4) *Cenchrus tribuloides* and *Cyperus brunneus* (bird), (5) *Uniola paniculata* (water), (6) *Andropogon glomeratus* (bird), (7) *Suriana maritima* and *Tournefortia gnaphalodes* (bird), (8) *Borrichia arborescens* and *Iva imbricata* (bird), and (9) *Ambrosia hispida* (water).—J. M. C.

Pythium and Chytridiaceae.—BUTLER has[13] made an extended study of the genus Pythium. The introductory part of his monograph is a somewhat lengthy account of the habits, structure, and biology of the members of the genus. The observations recorded have for the most part been described by earlier students of the group, and very little that is new is added. An observation relating to the morphology of the sporangia and conidia of the genus is of interest.

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[12] MILLSPAUGH, CHARLES F., Flora of the sand keys of Florida. Field Columbian Mus. Publ. Bot. Ser. 2:191–245. 1907.

[13] BUTLER, E. J., An account of the genus Pythium and some Chytridiaceae. Mem. Dept. Agric. India. Bot. Series 1: pp. 160. *pls.* 10. 1907.

The writer several times divided colonies of *P. intermedium* and of *P. rostratum*, keeping one-half of each colony in running water while the other half was left undisturbed. The half-colonies in running water produced almost exclusively sporangia, while the corresponding undisturbed halves produced conidia. In the systematic part of the work, 18 species are critically described and arranged. Four of these are new, one (*P. palmivorum*) being of interest on account of its unusual habitat, growing in the terminal buds of palms which are soon killed and destroyed by the fungus. Since palms grow only by the terminal bud, its death involves the destruction of the tree. Another form (*P. Indigoferae*) is epiphytic in the waxy covering of the leaves of *Indigofera arrecta*. Under the title "Species omitted" there are added brief notes on some 18 species whose descriptions are for the most part so fragmentary that identification is impossible. In the second part, a number of species of Chytridiaceae are described, with some observations on their structure and habits.—H. HASSELBRING.

Anatomy of Uvularia and Tricyrtis.—QUEVA[14] has followed his studies on Gloriosa and Littonia by an examination of the anatomy of Uvularia and Tricyrtis, which differ from the first-named genera in having a rhizome in place of a tuberous stem. In accord with this difference, Uvularia presents a simpler structure than Gloriosa, and Tricyrtis is still simpler in the disposition of its vascular strands. The bundles in the stem of Tricyrtis are all of the same rank, while Uvularia has bundles of several ranks; the larger ones are situated near the center of the stem and form the main vascular strands of the leaves, while the smaller ones run at the periphery of the stem and run to the margin of the leaves. In place of the cambium observed in the bundles of the tuber in Gloriosa, Uvularia presents only a radial arrangement of the cells of the procambial strands. These two conditions are sharply distinguished by the author, who accordingly throws doubt on the cambial nature of the cells in the bundles of sedges and grasses, figured by PLOWMAN and by CHRYSLER. The question appears to be one of definition of terms.—M. A. CHRYSLER.

The nucleus of Spirogyra.—The excellent methods and cytological experience of the GRÉGOIRE school are well shown in a late paper by BERGHS.[15] Both the chromatic and the achromatic figures are traced in detail. The so-called nuclear network of Spirogyra takes no part in the formation of chromosomes. In the prophase the nucleolus begins to show a double nature, for the chromosomes are differentiated within it, while a second substance preserves its spherical form. This second substance divides in the plane of the future cell wall and also becomes segmented into rod-shaped pieces, after which half passes with the chromosomes to each pole to form the daughter nuclei. No spirem is formed either in the

[14] QUEVA, CHAS., Contributions à l'anatomie des Monocotylédonées. II. Les Uvulariées rhizomateuses. Beih. Bot. Centralbl. **22**:30–77. *figs. 49.* 1907.

[15] BERGHS, JULES, Le noyau et la cinèse chez le Spirogyra. La Cellule **23**:55–86. *pls. 1–3.* 1906.